

1 TITLE OF THE INVENTION

2 Anti-Clogging Showerhead Device

3 APPLICANT

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5 CROSS REFERENCE TO RELATED APPLICATIONS

6 I claim the benefit of provisional patent applications 60/433,102 filed on Dec. 13, 2002, and  
7 60/454,740 filed on March 15, 2003.

8 BACKGROUND OF THE INVENTION

9 1. Field of the Invention:

10 The invention broadly relates to showerheads.

11 2. Prior Art:

12 A typical showerhead is comprised of a ball adapter attached to a water pipe extending from a  
13 wall, and a flared head attached to the ball adapter. Spray holes on the bottom end of the head  
14 emit a shower of water when the water is turned on. The head is pivotable on the ball adapter to  
15 direct the shower.

16 When the water is turned off, the inside of the showerhead is partially drained through the spray  
17 holes. However, the sealed volume of air above a small amount of remaining water is pulled  
18 upon by the weight of the remaining water, and a slight suction is developed which prevents the

1 remaining water from draining. The remaining water is evaporated gradually, and minerals in the  
2 water are left behind as the water is evaporated. The mineral deposits or scales slowly build up  
3 inside the showerhead and eventually clog the spray holes.

4 Clogging is a problem with dedicated showers, such as shower enclosures in homes or open  
5 showers in gyms. Clogging is usually not a problem with bath and shower combinations which  
6 have a diverter control lever which tends to be leaky and therefore helps drain the showerhead.

## 7 BRIEF SUMMARY OF THE INVENTION

8 The objects of the present anti-clogging showerhead device are:  
9 to more completely drain a showerhead to reduce mineral deposits and thus clogging;  
10 to drain the showerhead automatically or by manual control; and  
11 to be retrofittable to a prior art showerhead or water pipe, or to be provided in a new showerhead,  
12 water pipe, or water control valve.

13 An anti-clogging showerhead device is comprised of an air pathway upstream of the spray holes  
14 of a showerhead. When the water is turned off, air is drawn by the draining water into the  
15 showerhead above the spray holes through the air pathway. Therefore, suction above the water is  
16 prevented from developing, and the showerhead is able to drain more completely. The air  
17 pathway may be provided in the water pipe extending from the wall, in the showerhead, or in an  
18 add-on tubing connected between the showerhead and the water pipe. The air pathway may be  
19 comprised of a permanently open hole or a valve, which may be an automatic or manual valve.  
20 The automatic valve is preferably comprised of a flexible membrane which is pushed against a  
21 hole when the water is turned on, and retracted from the hole when the water is turned off.  
22 Alternatively, the valve may be comprised of a flap valve, a ball valve, a manual valve, etc.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

- 1
- 2 Fig. 1 is a sectional view of a first embodiment of an anti-clogging showerhead device.
- 3 Fig. 2 is a sectional view of a second embodiment thereof.
- 4 Fig. 3 is a sectional view of a third embodiment thereof.
- 5 Fig. 4 shows an example of the embodiment of Fig. 1 when draining.
- 6 Fig. 5 is a sectional view taken along line 5 – 5 in Fig. 4.
- 7 Fig. 6 shows the showerhead device of Fig. 4 when showering.
- 8 Fig. 7 shows an example of the embodiment of Fig. 2.
- 9 Fig. 8 shows an example of the embodiment of Fig. 3.
- 10 Fig. 9 shows an alternative valve for the showerhead device.
- 11 Fig. 9A is a sectional view taken along 9A – 9A in Fig. 9.
- 12 Fig. 10 shows another alternative valve.
- 13 Fig. 11 shows another alternative valve.
- 14 Fig. 12 shows another alternative valve.
- 15 Fig. 13 shows another alternative valve.
- 16 Fig. 14 shows another alternative valve.

- 1 Fig. 15 shows another alternative valve.
- 2 Fig. 16 shows another alternative valve.
- 3 Fig. 17 shows another alternative valve in an open position.
- 4 Fig. 18 shows another alternative valve in a closed position.

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## DRAWING REFERENCE NUMERALS

6	10. Air Pathway	11. Add-On Tubing
7	12. Upper End	13. Lower End
8	14. Showerhead	15. Water Pipe
9	16. Wall	17. Spray Holes
10	18. Ball	19. Air Hole
11	20. Membrane	21. Valve
12	22. Ring	23. Shoulder
13	24. Restrictor	25. Stop
14	26. Channel	27. Head
15	28. Flap	29. Water Pathway
16	30. Hole	31. Ball
17	32. Chamber	33. Inner Channel
18	34. Water Pathway	35. Outer Channel
19	36. Ball	37. Chamber
20	38. Inner Channel	39. Water Pathway
21	40. Outer Channel	41. Flap
22	42. Hole	43. Plate
23	44. Hole	45. Spring
24	46. Ball	47. Cage

1	48. Hole	49. Sleeve
2	50. Water Pathway	51. First Hole
3	52. Second Hole	53. Water Pipe
4	54. Hole	55. Shaft
5	56. Handle	57. Water Channel
6	58. Ring	59. Flat

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## DETAILED DESCRIPTION OF THE INVENTION

8 Figs. 1-2:

9 An anti-clogging showerhead device is comprised of an air pathway 10 upstream of spray holes  
 10 17 on a showerhead 14. When the water is turned off, air is drawn in through air pathway 10 by  
 11 the draining water into showerhead 14 above spray holes 17. Therefore, suction above the water  
 12 is prevented from developing, and showerhead 14 is able to drain completely.

13 Air pathway 10 may be comprised of a permanently open hole, an automatic valve which  
 14 automatically opens and closes when the water is respectively turned off and on, or a manual  
 15 valve which is manually operated by a user.

16 In the first embodiment shown in Fig. 1, air pathway 10 is provided in an add-on tubing 11 with a  
 17 threaded female upper end 12 and a threaded male lower end 13 for connecting between  
 18 showerhead 14 and a water pipe 15 extending from a wall 16. Air pathway 10 is positioned  
 19 upstream of spray holes 17 on showerhead 14.

20 Fig. 2:

21 In the second embodiment shown in Fig. 2, air pathway 10 is provided in water pipe 15.

1 Fig. 3:

2 In the third embodiment shown in Fig. 3, air pathway 10 is provided in showerhead 14. Air  
3 pathway 10 may be positioned anywhere on showerhead 14 upstream of spray holes 17.

4 Figs. 4-6:

5 An embodiment of air pathway 10 in add-on tubing 11 is shown in Figs. 4-6. In this example, air  
6 pathway 10 is comprised of an automatic valve which is comprised of one or more air holes 19  
7 through tubing 11, and a resilient membrane 20 which is moved against hole 19 when the water  
8 is turned on, and which is retracted automatically from hole 19 when the water is turned off.

9 In this example, membrane 20 is comprised of a tapered tubular sleeve. An upper end of the  
10 sleeve is attached to a mounting ring 22 clamped between a shoulder 23 inside tubing 11 and the  
11 end of pipe 15. An annular restrictor 24 is attached to a lower end of the sleeve. Tubing 11  
12 includes a stop 25 below restrictor 24 to limit longitudinal stretching of sleeve. In Fig. 4, the  
13 water is turned off and sleeve is automatically retracted to its normal shape away from hole 19.  
14 Air is allowed to enter through hole 19 and enable showerhead 14 to drain completely through  
15 spray holes 17. In the sectional view in Fig. 5, a star-shaped channel 26 is positioned between  
16 stop 25 (Fig. 4) and the lower end of tubing 11 for passing water when restrictor 24 is impinged  
17 on stop 25. In Fig. 6, the water is turned on and sleeve is automatically expanded radially against  
18 hole 19 to prevent water leakage.

19 Fig. 7:

20 An embodiment of air pathway 10 in water pipe 15 is shown in Fig. 7. It is comprised of a  
21 permanently open hole which is relatively small to limit water leakage when the water is turned  
22 on. The hole is preferably angled to roughly parallel the direction of spray holes 17.

1 Fig. 8:

2 An embodiment of air pathway 10 in showerhead is shown in Fig. 8. It is comprised of a  
3 permanently open hole in a ball 18 of showerhead 14. During showering, a head 27 of  
4 showerhead 14 is tilted to a normal showering position which covers the hole. After showering  
5 and the water is turned off, head 27 is tilted to expose the hole and allow air to enter showerhead  
6 14 to drain it.

7 Figs. 9-18:

8 The air pathway may be comprised of any type of one way automatic valve. Some examples are  
9 shown in Figs. 9-14.

10 In Fig. 9, the valve is comprised of a spring flap 28 with an upstream portion anchored to a ring  
11 58 in a water pathway 29, which may be comprised of a showerhead, a connected water pipe, or  
12 an add-on pipe between the showerhead and the water pipe. Water pathway 29 is shown as an  
13 add-on pipe in this example. A downstream portion of flap 28 is positioned adjacent a through  
14 hole 30 in water pathway 29. Flap 28 is preferably made of a resilient material, such as silicon or  
15 rubber. Flap 28 is pressed against hole 30 when water is flowing, and automatically returned to a  
16 normally open position when water is stopped. As shown in the sectional view in Fig. 9A, water  
17 pathway 29 includes a flat interior surface 59 around the inner end of hole 30 for closely  
18 engaging flat flap 28. Alternatively, the interior of water pathway 29 may be completely curved,  
19 and flap 28 may be curved to match the curvature of the water pathway.

20 In Fig. 10, the valve is comprised of a ball 31 in a chamber 32. Inner channels 33 are connected  
21 between an inner wall of a water pathway 34 and an outer channel 35 is connected between  
22 chamber 32 and an outer wall of water pathway 34. When the water is turned on, ball 31 is  
23 pushed against the inner end of outer channel 35 to prevent water leakage. When the water is

1 turned off, ball 31 falls away from outer channel 35 to allow air to flow in from outer channel 35  
2 to one of inner channels 33 into water pathway 34.

3 In Fig. 11, the valve is comprised of a ball 36 in a chamber 37. An oval inner channel 38 is  
4 connected between an inner wall of a water pathway 39, and a circular outer channel 40 is  
5 connected between chamber 37 and an outer wall of water pathway 39. When the water is turned  
6 on, ball 36 is pushed against the inner end of outer channel 40 to prevent water leakage. When  
7 the water is turned off, ball 36 falls against inner channel 38. Since inner channel 38 is oval  
8 shaped, air may flow in from outer channel 40 through inner channel 38 into water pathway 39.

9 In Fig. 12, the valve is comprised of a normally open spring flap 41 with a proximal end attached  
10 adjacent a hole 42, and a distal end positioned over hole 42.

11 In Fig. 13, the valve is comprised of a plate 43 positioned over a hole 44. Plate 43 is biased by a  
12 spring 45 under plate 43 to a normally open position.

13 In Fig. 14, the valve is comprised of a ball 46 in a cage 47 positioned adjacent a tapered hole 48.

14 In Figs. 15-16, the valve is comprised of a manual valve, which is comprised of a sleeve 49  
15 around a water pathway 50. Sleeve 49 is rotated to misalign a first hole 51 thereon with a second  
16 hole 52 in water pathway during showering to prevent water leakage, and rotated to align hole 51  
17 with hole 52 to permit air flow.

18 In Fig. 17, the valve is comprised of a water control valve 21 along a water pipe 53 connected to  
19 a showerhead. A transverse hole 54 is positioned in a shaft 55 connected to a handle 56. When  
20 shaft 55 is pushed inward, hole 54 is communicably connected with water pipe 53 to let air  
21 inside. Water pipe 53 is blocked from passing water by a solid portion of shaft 55. When shaft 55  
22 is pulled out, hole 54 is disconnected from water pipe 53 to prevent water leakage from hole 54.  
23 A water channel 57 in shaft 55 is moved into alignment with water pipe 53. When shaft 55 is  
24 rotated, water channel 57 is rotated to into axial alignment with water pipe 53 to pass water.



- 1 Although the foregoing description is specific, it should not be considered as a limitation on the
- 2 scope of the invention, but only as an example of the preferred embodiment. Many variations are
- 3 possible within the teachings of the invention. Therefore, the scope of the invention should be
- 4 determined by the appended claims and their legal equivalents, not by the examples given.